



Communicator

September 2012

BC-WARN

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The Making of FD '12
Our Best Result Ever

Tech Talk
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Plus

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ve7sar.net



Morse on Mars!

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The Monthly Newsletter of the Surrey Amateur Radio Club



The Communicator



**SURREY
AMATEUR RADIO CLUB**

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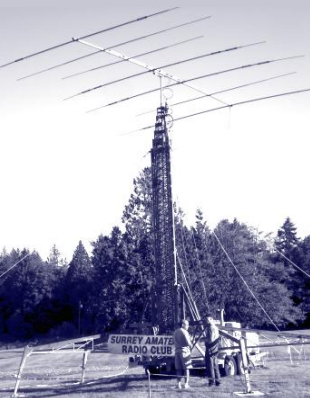
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VIA THE WEB
www.ve7sar.net

The **SARC Communicator** is published monthly for members of the Surrey Amateur Radio Club.

SARC maintains a website at www.ve7sar.net that includes club history, meetings, news and other information.



Understanding The SARC Repeater System

Normally our monthly minutes would be presented here however, as this is the first Communicator of the new season, there are no new minutes to present.

The SARC repeaters are linked together via an [ARCOM RC-810](#) repeater controller. The current configuration as of August 2012 is for both our VHF and UHF repeaters to be linked together allowing for QSOs to span across the VHF and UHF repeaters. For example: All traffic on the VHF repeater is heard on the UHF repeater and vice versa. In this configuration both repeaters are connected to IRLP node 1736. If a scenario of high traffic was to arise in which both repeaters are needed for separate use, they can be disconnected with the VHF repeater remaining connected to IRLP node 1736 and the UHF repeater connected to node 1737.

To properly understand our repeater system, It's important to distinguish

the features of the ARCOM controller and the features of the IRLP nodes:

The ARCOM Controller provides:

- Flexible Linking between VHF, UHF repeaters, and the two IRLP nodes.
- Vocal & CW Repeater ID
- Hangtime
- Automatic time of day announcement

IRLP node 1736 provides:

- IRLP & Echolink connectivity
- Voicemail system
- Signal check function
- On demand time of day announcement
- Pre-recorded club event announcement

IRLP node 1737 provides:

- IRLP connectivity
- Signal check function
- On demand time of day announcement

CLUB EXECUTIVE 2012-2013

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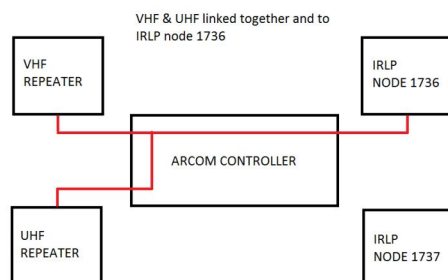
Meeting Minutes
SEPARS Report
New Improved VE7RSC
QRM
Chronicle of a tower Installation
Summer Calendar
President's Report

	SEPARS Net	SARC Net
1 st Tuesday	Drew VA7DRW Jay VE7OFH Standby	Drew VA7DRW
2 nd Tuesday	Dixie VA7DIX Alan VA7BIT Standby	Jinty VA7JMR
3 rd Tuesday	Rob VE7CZV	John VA7XB
4 th Tuesday	Peter VE7PGX Dixie VA7DIX Standby	Anton VE7SSD
5 th Tuesday	Jinty VA7JMR	Bill VE7XS
Want a turn at Net Control? Contact the Net Manager ve7ti @ separs.net		

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, (optional Tone Squelch 110.9) also accessible on IRLP node 1980 and Echolink node 496228. On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 Coming soon, a repeater at 224.000MHz (-1.6MHz).

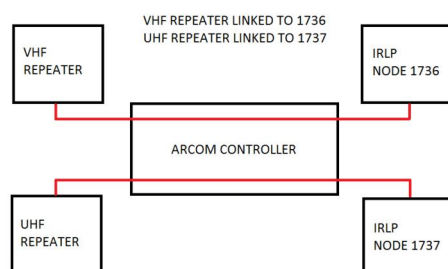
SARC Repeater system diagrams:

Configuration #1 (default, low traffic)



Configuration #2

May be used during times of high repeater traffic like club events, exercises, etc.



IRLP Usage (basic)

For new IRLP users, please refer to the IRLP Operating Guidelines:

<http://www.irlp.net/guidelines.html>

The guidelines page explains how the system works, explains what reflectors are and how they work, and provides important instruction on how to use IRLP. All IRLP users should review the guidelines from time to time.

Initiate an IRLP connection:

Hold PTT, say your callsign, and dial the node or reflector number via DTMF keypad. Release PTT once 4-digit dialing sequence is complete.

End an IRLP connection:

Hold PTT and dial "73" via DTMF mic. Release PTT. Note: when disconnecting from a reflector, it is best not to identify before you dial "73." Wait until the link has dropped, then say your callsign so people locally here on the repeater know who disconnected the link. It can become annoying to those who monitor the

reflector to hear your ID before you disconnect. A busy reflector will often have two of three nodes connect and disconnect per minute.

The IRLP network status page:

<http://status.irlp.net>

Use the status page to view nodes by country, see reflector usage, etc. Node lists can be printed for easy reference.

A second option for viewing reflector status and activity:

http://irlp.g4eid.co.uk/status/all_reflectors.html

Echolink Usage (basic)

Our Echolink node number for VE7RSC-VHF: 496228

*NOTE: As of August 2012, only node 1736 has Echolink capability. Echolink is not available via node 1737.

Initiate an Echolink connection:

Hold PTT, say your callsign, and dial the echolink node number preceded by an asterisk. Release PTT once dialing sequence is complete.

For example: PTT + *190638 will connect to echolink node number 190638. (VE7RHS repeater at UBC)

End an Echolink connection:

Hold PTT and dial "73" via DTMF mic. Release PTT.

Echolink status page:

<http://www.echolink.org/logins.asp>

For more echolink info:

<http://www.echolink.org/>

IRLP NODE 1736 additional features:

Voice mail:

To leave a message:

1. Hold PTT, dial "AAA" and release PTT.
2. The repeater will respond with a vocal prompt "Who is this message for?"
3. Hold PTT, say the callsign of the person you wish to leave a message for, release PTT (note: voice mail has a 5 second limit to receive this information).
4. The repeater will respond with a vocal prompt "Please start your message."

(Continued on page 4)

DOWN THE LOG...

SARC Monthly Meetings

2nd Wednesday (Sept-Jun)
1900 hrs local at the Emergency Management BC PREOC,
14275 96th Avenue, Surrey, BC

Weekly Club Breakfast

Friday at 0830 local
ABC Country Restaurant at
600 - 7380 King George Blvd.
Surrey

SARC Net

Tuesday at 2000 hrs local
on 147.360 MHz (+) Tone=110.9

SEPARS Net

Tuesday at 19:30 hrs local
on 147.360 MHz (+) Tone=110.9

Announcements & News

SEPARS Monthly Workshop
Third Thursday, 1900-2130 local
Rm. 214, 13569 - 76th Avenue,
Surrey.

SEPARS Training

Fourth Saturday, 0830 local,
Firehall #1, 88 & 132nd Street,
Surrey

On the Web

ve7sar.net

Between newsletters, watch your e-mail for announcements of events, monthly meetings and training opportunities. These announcements Summer also be found on our web page.

Twitter

[@ve7sar](https://twitter.com/ve7sar)

Photos

[Web Albums](#)

5. Hold PTT and say your message. The message time limit is 60 seconds. Release PTT when finished.

6. The repeater will respond "Message complete, thank you."

To check for messages:

1. Hold PTT, dial "BBB"

2. The system will respond "There are no messages" if voicemail box is empty, or the system will respond "There are messages for: + "

If you wish to listen to the message, it is important to note the message number. If there is only one message in the voicemail box, you can assume that message will be message number 1.

To listen to a message:

1. Hold PTT, on your radio or mic keypad dial "AAx" where "x" is the message number. For example, to listen to message number 1, dial "AA1"

To delete a message:

1. Hold PTT, dial "BBx" where "x" is the message number. For example, to delete message number 1, dial "BB1" The repeater will respond "Message number deleted."

2. If there is more than one message in the message box, when message number one is deleted, message number two will move up to assume the position of message number one.

3. If you have listened to a message that was addressed to you, please delete it once you have finished with it.

Other repeater functions:

Signal check:

The repeater can make a short recording of your audio and play it back to you to assist you in testing your radio.



To initiate a signal check:

1. Hold PTT, dial "A3", release PTT

2. The repeater will respond "RX Check ready."

3. Hold PTT, provide some test audio, release PTT.

4. Once you release PTT, the repeater will respond by playing back your last transmission. Give it a try, it's a handy feature. Some of us use it several times a day.

To initiate on demand time of day announcement:

1. Hold PTT, dial "C", release PTT.

2. The repeater will respond "The time is, XX:XX am/pm."

Quick reference summary:

- AAA leave a message
- BBB check for messages
- AAX plays message X
- BBX deletes message X
- A3 signal check
- C clock
- *69 Function: reads back the last inbound and outbound connections via IRLP along with times and node numbers.

Additional/misc info:

Embedded node install/diagnostic manual

http://www.irlp.net/embedded/Embedded_Info.pdf

September 12th SARC Meeting

SARC's first Fall Meeting features a BCWARN Update. Ian Procyk VE7HHS will be talking about the history of the project, where we are today, how we are interfacing with Surrey via SARC and SEPARS as well as future projects.

Geoff Armstrong (VE7KA), Bob Holowenko(VE7WNK), Jeremy Cohoe(VA7NSA), Duncan Meakins(VE7NEO) and possibly Dave Cameron (VE7LTD) will assist Ian with his talk and live system demo.

Please join us at the Emergency Management BC PREOC located at 14275 96th Avenue, Surrey

BC Wireless Amateur Radio Network

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Tech Talk John Schouten VE7TI

All About Grounding

Nothing like a fierce electrical storm to get Hams talking about susceptibility to lightning strikes. Well, we experienced just such a storm in early August, which provides the perfect opportunity to review the topic.

Proper grounding of radio stations is probably one of the least understood aspects of ham radio. It almost has a certain aura of mystique or magic about it instead of being the pure science it should be. This is a very important aspect of any radio installation. There are two major criteria we need to consider when doing the planning for this installation. The primary reason has to be safety, both for ourselves as the operator who will be seated at the controls, but also for our equipment and possibly the structure... probably our home. The second of course has to do with the performance of our antenna system and it's ability to radiate an efficient signal. Let's treat these separately for now and they will combine into a total plan at the end.

Surge (or Safety) grounding

We need to protect our installation and ourselves from lightning, but... There is no protection against a direct lightning hit! It has way more power than we can shunt to ground safely or our budget can handle. That is what insurance is for. We CAN however make our installation an unattractive target to lightning. We can also take care of any secondary surges and static build up that can destroy equipment and give healthy zaps enough to more than get your attention. There is nothing more frustrating than trying to talk on a radio and you keep getting zapped on the chin while doing so! I speak of personal experience here. Let's let it go at that. The Safety ground has to consist of enough ground contact surface area to safely dissipate the surges into the soil safely. Multiple ground rods connected with solid 100 ground wire is best. You should have one rod where your antenna support structure is whether it be a tower or mast or roof tripod, etc. It must have at least 4 gauge bare or insulated, NOT stranded wire. These surges can easily be hundreds of amps. DO NOT scrimp on the wire. This is your life you are dealing with. If stranded wire is used it should be no more than 8 conductors. Heavy bolt type connectors should be used for all connections. You should also employ a non corrosive type coating. All of these connectors and grease are available at your good home

supplies or electrical supply houses. All grounds for the installation should be bonded together at the ground. NEVER daisy chain grounds. ALL connections from devices should go DIRECTLY to closest ground point. Use eight foot copper ground rods for all. Bond the rods with single 100 solid bare copper wire. Drive a ground rod for electrical supply to house if you do not already have one. Bond it to others with aforementioned wire. If you have overhead service to house, run wire direct to neutral wire at feed point and use split bolt connections with grease for corrosion. If you have underground service, ground at meter box. If your power company objects, run it to your service panel. You need a minimum of one eight foot ground rod for every protected structure, ie, every mast, tripod, vertical antenna, etc. These must all be connected together AT THE GROUND. Run bare copper between the separate ground rods to form a ground system. The bare copper provides additional surface contact area for the ground system. It should be underground, but does not need to be deep for any engineering reasons. Make sure you make yourself a map of the runs for future projects to avoid hitting and digging up the system in the future. Use heavy duty bolted connectors designed for this service. If you have access to a ground megger or ground tester the system should be less than 15 ohms. In sandy soil this can take several rods to achieve. I have had to put down 3, 32 foot rods (consisting of four 8 foot rods with couplers and driven in with a power driver) in sand to get the measurement needed. This should take care of our safety grounds.

RF Grounding

RF grounding is considerably different than surge grounding. First thing is you are working with RF. Since it is an AC signal it has impedance. The length of the ground runs has much more to do with the fraction of a wavelength at the frequency involved than the DC resistance of the wire. While the DC resistance of a ground wire may be only a fraction of an ohm, the impedance (or the AC resistance at RF frequency) can easily be hundreds or thousands of ohms on the same wire. This can make it pretty difficult to get an effective RF ground. Remember an RF ground wire is just a short antenna! We want to make it as LOUSY an antenna as possible! We really don't need it radiating extra RF inside our shack. It is supposed to remove this stuff not cause

it. An effective RF ground needs to be less than a quarter wave length at the highest frequency used. As you can see there is no such thing as an effective ground for VHF or UHF. We will concentrate our efforts to 10 meters and above. This means our ground wire from radio to ground must be about 9 feet or less! This is still pretty difficult. All radios, tuners, meters, etc in radio system should be grounded in a star ground configuration. The common point should be at the tuner if one is used, otherwise a ground bus bar can be purchased at an electrical house. All Connections to radios should be with either insulated or bare wire with as few strands as possible. RF likes smooth surfaces best. DO NOT USE braid for RF connections. This is an old wives tale! Your ground run should go directly to the ground where you should have a ground rod for the connection point, (which will be connected to all your other ground rods in the system as discussed above). This run must be less than nine feet to be effective. If you are on the second floor this will make this length impossible. Use of a shielded ground* wire can stop radiation of the ground wire but you will still have a lousy ground. Nothing can change this. Ground wire tuners only turn your ground wire into a counterpoise for your antenna, meaning it WILL radiate. This will only ensure that the low voltage point of your antenna will be at your radio. Next we need to form our RF counterpoise outside at our ground system. You will next need to add some bare copper wire at the RF feedpoint where your shack ground wire connects to. I prefer to use bare 8 gauge copper ground wire here. It is single conductor, bare copper and easily bent and run around house. Single strand is best but it should definitely be bare even if you have to strip insulation off wire. Run it around the house or anywhere it will stay out of the way of lawn equipment but not buried deeper than ½ inches. This is CRITICAL. RF will not penetrate soil deeper than this at these frequencies. Those bonding wires you have between ground rods and ground rods do not exist to the RF! Burying this wire under wood chips or similar non conductive landscaping, etc is the way to go. This counterpoise should be as long as the wire antennas you have in the air. For most hams this will be about 130 feet. Longer is better. I run all the way around my house. I have found the eight gauge will push into the spacing used between driveway and foundation when persuaded with the proper tool, (READ HAMMER). You can connect the loop back on itself at the feed point. This can add several S units to the receive signal and dramatically reduce noise on the signal, though nothing will help all the noise on 80 or 160 meters. Years ago I installed a long wire antenna that was about 250 feet long and about 50 feet in the air. This should work fantastic you say. I had three ground rods outside window of shack with single solid copper ground wire direct to tuner. Ground wire length was only six feet. All three rods were

spaced about eight feet apart with connecting bare wire interconnecting them... in other words, a really good surge ground. What I did not realize at that time was how lousy my RF ground was. We could not tune the antenna on most frequencies and we kept getting zapped from the radio or microphone when we transmitted. Also, our signal reports were lousy. So, after consulting some experts, I added 250 feet of counterpoise around the building consisting of some bare 6 gauge copper wire I had. The radio was on while I rolled it out and a friend was listening to the broadcast on 40 meters, (OK it was night time-best time to do antenna work right!) Anyway he reported the broadcast was only about S 4-5 on meter. As I rolled out the counterpoise it rose to 40 over S9 and came in much clearer. We were able to tune everything easily now and SWR was rock stable. When we did a signal test, the station we had talked to before accused us of running a contest amplifier. We could not convince them it was only 100 watts, same as before and the same antenna!

SUMMARY

Don't underestimate the importance of a good ground system.

Include it into the planning of that ultimate shack you are working on. Don't scrimp on good copper wire and connectors. Aluminum can be used above ground but never in ground. Add one size to aluminum to achieve same current capability. Ground everything to the system. A ground run to ductwork in house can alleviate a lot of noise. A run to water pipes should go direct to ground... NEVER to radios, NEVER connect radios to ANYTHING inside the house for ground purposes. Always run all grounds from everything to ground directly. In other words, your furnace ducts will get one run, your water pipes will get one, etc. Don't daisy chain to save wire. If you have a chain link fence in back yard, run a bonding wire underground from ground system to it and bond well. A solid aluminum or copper wire run along bottom of fence as a bonding device will make it a great addition to the system. Weave it through the bottom fence fabric and bond every few feet with a split bolt connector. The power company does this with all their fences around their power stations.

A shielded ground can be made using RG 8 or similar coax to replace the ground wire. Connect both inner and outer shields to the Ground rod and connect the center only to the radio. Add a .1uf 1000 volt cap between ground and shield at this end.

73 Bill - N8SA

Coax should be grounded at two sites, first at the antenna and then just before entering the house. Is there an

advantage in grounding at more than these sites?

With grounds the most common experience is “the more the merrier”. As you add more, however, you usually reach a diminishing returns (no pun intended) situation where there is no *observable* improvement: that’s usually a good place to stop. There are also exceptional circumstances where grounding increases noise problems, but these, in my experience, are much rarer than the pundits who preach against “ground loops” seem to think.

Even a semi-quantitative theoretical treatment of grounding in oversimplified situations requires heavy math at RF. Experimentation is thus required even if one has done elaborate calculations. It’s often easier to use the theory as a guide to what to try, and then experiment.

I would also assume that the antenna is grounded when it is connected to the receiver as the outer braid of the coax is in continuity with the receiver chassis.

What’s ground? If connect the shield of my coax (which is grounded outside) to the antenna input of my R8, I hear lots of junk, indicating that there is an RF voltage difference between the coax shield and the R8 chassis. Last night this measured about 55.5, which is about -93 dBm (preamp off, 6KHz bandwidth). That’s a lot of noise: it was 18 dB above my antenna’s “noise floor”, and 26 dB above the receiver’s noise floor.

This sort of disagreement about ground potential is characteristic of electrically noisy environments. The receiver will, of course, respond to any voltage input that differs from its chassis ground. The antenna, on the other hand, is in a very different environment, and will have its own idea of what ground potential is. If you want to avoid noise pickup, you need to deliver a signal, referenced at the antenna to whatever its ground potential is, in such a way that when it arrives at the receiver, the reference potential is now the receiver’s chassis potential.

Coaxial cable represents one way to do this. Coax has two key properties:

1. The voltage between the inner conductor and the shield depends only on the state of the electromagnetic field within the shield.
2. The shield prevents the external electromagnetic field from influencing the internal electromagnetic field (but watch out at the ends of the cable!).

So, it’s easy, right? Run coax from the antenna to the receiver. Ground at the antenna end will be whatever the antenna thinks it is, while ground at the receiver end will be whatever the receiver thinks it is. The antenna will produce the appropriate voltage difference at the input side, and the receiver will see that voltage difference uncontaminated by external fields, according to the

properties given above.

Unfortunately, it doesn’t quite work that way. It’s all true as far as it goes, but it neglects the fact that the coax can also guide noise from your house to your antenna, where it can couple back into the cable and into your receiver. To see how this works, let me first describe how this noise gets around.

The noise I’m talking about here is more properly called “broadband electromagnetic interference” (EMI). It’s made by computers, lamp dimmers, televisions, motors and other modern gadgets. I have all these things. In many cases, I can’t get them turned off, because it would provoke interfamilial rebellion. However, even when I turn them off, the noise in the house doesn’t go down very much, because my neighbors all have them too. In any case, one of the worst offenders is my computer, which is such a handy radio companion I’m not about to turn *it* off.

Some of this noise is radiated, but the more troublesome component of this is conducted noise that follows utility wires. Any sort of cable supports a “common mode” of electromagnetic energy transport in which all of the conductors in the cable are at the same potential, but that potential differs from the potential of other nearby conductors (“ground”). The noise sources of concern generate common mode waves on power, telephone, and CATV cables which then distribute these waves around your neighborhood. They also generate “differential” mode waves, but simple filters can block these so they aren’t normally a problem.

So, let’s say you have a longwire antenna attached to a coaxial cable through an MLB (Magnetic Longwire Balun). Suppose your next door neighbor turns on a dimmer switch. The resulting RF interference travels out his power lines, in through yours, through your receiver’s power cord to its chassis, and out your coaxial cable to your MLB. Now on coax, a common mode wave is associated with a current on the shield only, while the mode we want the signal to be in, the “differential” mode, has equal but opposite currents flowing on shield and inner conductor. The MLB works by coupling energy from a current flowing between the antenna wire and the coax shield into the differential mode. But wait a second: the current from the antenna flows on the coax shield just like the common mode current does. Does this mean that the antenna mode is contaminated with the noise from your neighbor’s dimmer?

The answer is a resounding (and unpleasant) yes! The way wire receiving antennas work is by first moving energy from free space into a common mode moving along the antenna wire, and then picking some of that off and

coupling it into a mode on the feedline. In this case, the common mode current moving along the antenna wire flows into the common mode of the coax, and vice versa. The coax is not just feedline: it's an intimate part of the antenna! Furthermore, as we've seen, it's connected back through your electrical wiring to your neighbor's dimmer switch. You have a circuitous but electrically direct connection to this infernal noise source. No wonder it's such a nuisance!

The solution is to somehow isolate the antenna from the common mode currents on the feedline. One common way to do this is with a balanced "dipole" antenna. Instead of connecting the feedline to the wire at the end, connect it to the middle. Now the antenna current can flow from one side of the antenna to the other, without having to involve the coax shield. Unfortunately, removing the necessity of having the coax be part of the antenna doesn't automatically isolate it: a coax-fed dipole is often only slightly quieter than an end-fed longwire. A "balun", a device which blocks common mode currents from the feedline, is often employed. This can improve the situation considerably. Note that this is not the same device as the misnamed "Magnetic Longwire Balun".

Another way is to ground the coaxial shield, "short circuiting" the common mode. Antenna currents flow into such a ground freely, in principle not interacting with noise currents. The best ground for such a purpose will be a earth ground near the antenna and far from utility lines.

Still another way is to block common mode waves by burying the cable. Soil is a very effective absorber of RF energy at close range.

Unfortunately, none of these methods is generally adequate by itself in the toughest cases. Baluns are not perfectly effective at blocking common mode currents. Even the best balun can be partially defeated if there's any other unsymmetrical coupling between the antenna and feedline. Such coupling can occur if the feedline doesn't come away from the antenna at a right angle. Grounds are not perfect either. Cable burial generally lets some energy leak through. A combination of methods is usually required, both encouraging the common mode currents to take harmless paths (grounding) and blocking them from the harmful paths (baluns and/or burial).

The required isolation to reach the true reception potential of the site can be large. According to the measurements I quoted above, for my site the antenna noise floor is 18 dB below the conducted noise level at 10 MHz. 18 dB of isolation would thus make the levels equal, but we want to do better than that: we want the pickup of common mode EMI to be insignificant, at least 5 dB down from the antenna's floor. In my location the

situation gets worse at higher frequencies as the natural noise level drops and therefore I become more sensitive: even 30 dB of isolation isn't enough to completely silence the common mode noise (but 36 dB *is* enough, except at my computer's CPU clock frequency of 25 MHz).

Getting rid of the conducted noise can make a huge difference in the number and kinds of stations you can pick up: the 18 dB difference between the conducted and natural noise levels in the case above corresponds to the power difference between a 300 kW major world broadcaster and a modest 5 kW regional station.

The method I use is to ground the cable shield at two ground stakes and bury the cable in between. The scheme of alternating blocking methods with grounds will generally be the most effective. The ground stake near the house provides a place for the common mode noise current to go, far from the antenna where it cannot couple significantly. The ground stake at the base of my inverted-L antenna provides a place for the antenna current to flow, at a true ground potential relative to the antenna potential. The buried coax between these two points blocks noise currents.

There has been some discussion of grounding problems on this and related echoes. I believe it has been mentioned that electrical codes require that all grounds be tied together with heavy gauge wire.

I'm no expert on electrical codes, and codes differ in different countries. However, I believe that any such requirement must refer only to grounds used for safety in an electric power distribution system: I do not believe this applies to RF grounds.

Remember that proper grounding practice for electrical wiring has very little to do with RF grounding. The purpose of an electrical ground is to be at a safe potential (a few volts) relative to non-electrical grounded objects like plumbing. At an operating frequency of 50/60 Hz, it needs to have a low enough impedance (a fraction of an ohm) that in case of a short circuit a fuse or breaker will blow immediately.

At RF such low impedances are essentially impossible: even a few centimeters of thick wire is likely to exhibit an inductive impedance in the ohm range at 10 MHz (depends sensitively on the locations and connections of nearby conductors). Actual ground connections to real soil may exhibit resistive impedances in the tens of ohms. Despite this, a quiet RF ground needs to be within a fraction of a microvolt of the potential of the surrounding soil. This is difficult, and that's why a single ground is often not enough.

A little experimentation with my radio showed that the chassis was directly connected to the third (grounding)



The Contest Contender

Fred Orsetti VE7IO & Jim Smith VE7FO

HITTING THE SAR REPEATER ON 70 cm

From the Dunbar Area of Vancouver

Some people will go to any lengths
when something bugs them

All photos taken on VE7FO'S roof or
in the shack



MFJ Dual-Band MagMount



Yuck—Repeater is S3—Put Up A Better Antenna



Sturdily Mounted New Antenna Mast



Lower Mast-to-Base Clamp



Upper Mast-to-Base Clamp



There's An Access Hatch Behind The Siding



Hmmm... Where Is It?



Here It Is Showing Heliax Etc Entering It



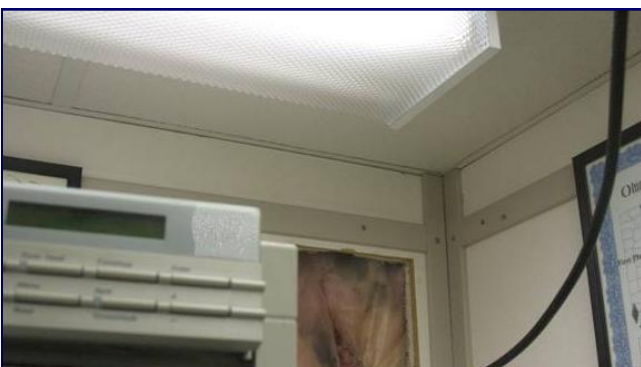
Oh No, It's Stuck Behind Those Shingles



Let's Open Up The Soffit To See What We Can Find



Problem Fixed!





SEPAR Report Fred Orsetti VE7IO



Changes to the Tuesday Evening Net

With the SEPAR net on Tuesday August 28th we introduced a new message handling program. For now, the practice message portion of the net has been suspended and replaced with a training session on the various components of the NTS message.

There are a number of training manuals and documents available either on the internet or in various emergency communications books so to ensure that all SEPAR members have the same information we will be using the NTS Handbook available on the BC/Yukon net website. The document can be downloaded from www.members.shaw.ca/brasskey/NTS%20HANDBOOK.pdf.

Training will follow the NTS handbook and break down into the preamble, the addressee, the body of the message and the signature. In addition each heading will be discussed as to the proper use on phonetics, pro-words, numbering, date and time format, originator and handling instructions. SEPAR members are encouraged to interact with questions and discuss the session training topic.

As SEPAR is an organization dedicated to emergency communications and traffic handling the net control will entertain formal traffic at any time during the net.

CN Family Day

Again this year SEPAR will be participating in the annual CN Family Day event held at CN's Thornton Yard. If you have not been to this event it is an opportunity to view our railroad facility as well as enjoy a train ride and family fun. SEPAR will be demonstrating our emergency communications ability along with Search and Rescue and the Surrey Emergency Program.

Prepared for SEPAR by

Fred VE7IO

SEPAR Meetings

Third Thursday of each month starting at 1900 hrs

Fourth Saturday of each month starting at 0900 hrs

Location and event schedule can be found at separ.shutterfly.com—click on the calendar tab



Saturday Training Days

There were two recent training days, one in July and one in August. Perfect weather allowed us to set up kits and antennas in the outdoors.

There was a review of kit deployment and activation, use of the 2820 radios and most of the group built and tuned a roll-up J-Pole antenna.

Both work sessions were followed by a barbecue and some social time.



Chronology of a Tower Installation – Part 2

Last month I described my efforts to factor in the various constraints at my QTH around location and installation of a self-supporting tower, and then to begin digging the foundation hole. Persistent effort with the shovel and jackhammer gradually got the job done over a period of 3 weeks, with the hole ultimately reaching the design depth of 6 ½ ft deep.



Soil from the last 2 ft had to be loosened, shoveled into buckets and lifted out by rope. I was lucky to encounter no significant amount of water or large boulders, just stones and stiff clay, the latter of which turned mushy if allowed to get wet after loosening and before removal. The result was a hole of desired dimensions with vertical, competent sides and no need for formwork below grade. I actually made the hole 60 in x 63 in wide, which is larger than the 4.5 ft x 4.5 ft called for in the spec.

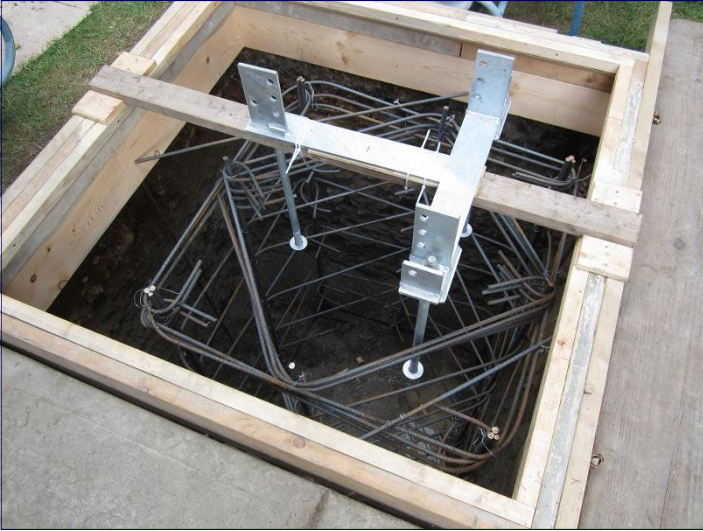
Next I purchased re-bar in 20 ft lengths and constructed the reinforcing cage later to be lowered into the hole. This proved to be a challenge as rebar does not easily bend and moreover, it tends to bend where you don't want it. After some experimentation and initially poor results, I made a bending jig that allowed all the critical pieces to be fabricated to identical size and shape. Bending was done with a 2 ft piece of steel pipe inserted over the rebar, held in place in a vice or in the jig. I then assembled the various pieces of rebar into the final configuration by first driving the 8 vertical elements a short distance into the ground to temporarily hold them upright, then tie-wrapping the horizontal elements one-

by-one to the vertical elements from the ground upwards. I left off the top elements initially to limit the weight while the cage was lowered into the hole, then added them later once the cage was in place. The contraption was rather wobbly until surrounded by concrete.



After completing the rebar cage by adding the final horizontal elements in situ, a head frame of the required size was fabricated from 2x6 and 2x10 lumber, positioned over the hole and the rebar cage and shimmed level. Some finishing details were added to the frame to give the final product a beveled edge. I then made up a temporary 2x4 support for the steel tower base which I had purchased from the manufacturer, US Towers. Prior to this I had acquired three 27 inch long bolts of correct ASTM specs from a local supplier, Trydor in Surrey (half the price of ordering from US Towers). The assembly was placed on the frame in readiness for concrete to be poured. I had also acquired three copper-plated steel ground rods which





were hung from the outside edge of the frame to be embedded into the edges of the concrete.

The foundation required about 6.5 cu. yd of concrete, but ready-mix was not feasible for several reasons, so it all had to be mixed manually. For this I had 8 cu. yd of Navy Jack delivered along with 42 bags of cement and moved it all to the back yard in readiness for the pour. At this point, I called for assistance as the pour had to be done all at one time, and this was more concrete than one or two persons could easily manage in a single day. Sean VA7CHX, Anton VE7SSD, John VE7TI and Ed (a non-ham friend) came to my rescue. We set up two rented mixers next to the hole with the Navy Jack, cement and water close by. I also rented a concrete vibrator which was lowered into the mix periodically during the pour and used to remove entrained air and distribute the concrete around the rebar and anchor bolts. Starting at 0730 on a warm Thursday morning, the crew continued mixing and pouring until the job was done around 1300. The top was leveled with a screed, then left for an hour or two to

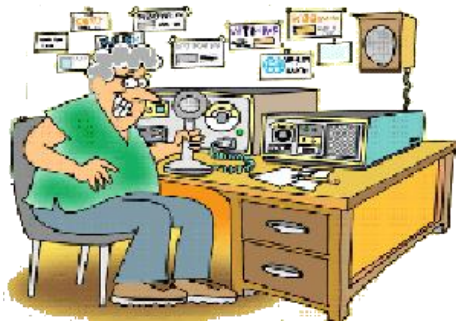
partially set before finishing the surface. The forms were removed the next day and the concrete kept moist for several days thereafter during the hot weather to improve curing.



This tower is hinged at the base and can be raised and lowered with a special fixture and hand winch, making erection a relatively simple matter. Shortly, I plan to temporarily connect the tower to the base, raise it to a vertical position then adjust the leveling nuts below the base to ensure the tower will be absolutely plumb. Once I am satisfied with this, I will remove the tower and fill in the space beneath the base with thin-set mortar. The tower will again be attached to the base and raised. Our next installment will describe these steps.

~John Brodie VA7XB





QRM ...from the Editor's shack

*Do you have a photo or bit of club news to share?
Something to sell or something you are looking for?
Email it to ve7ti@separ.net for inclusion in this column.*

Incoming QSL Bureau

The following message is from Ken Clarke, VE7BC, manager of the VE7/VA7 Incoming QSL Bureau:

I am personally unable to attend ComFest 2012. I realize there are many folks who will be attending the event who I may have cards for. This year we would like to try a different system of distributing the cards. Your cards will be available for pick-up at ComFest if you contact me via email in advance. If you are planning to attend ComFest and would like me to check to see if you have any incoming cards in the bureau please send me a quick email to ve7bc@shaw.ca. I will reply to let you know if there are cards for you. I will prepare and send your cards to ComFest and have them available there for pick-up. Please note the only cards that will be available for pick-up at ComFest this year will be for those who have contacted me in advance. If you have any questions or concerns please contact me at ve7bc@shaw.ca.

Thanks, Ken Clarke, VE7BC

NSARC will be offering the Advanced Licensing Course Saturday mornings through Sept - Oct 2012.

Where: North Shore Emergency Management Office (NSEMO) , 147 East 14th Street, North Vancouver, BC V7L 2N4 which is in the. RCMP / Gerry Brewer building. Enter off 14th street, via doors to your left. And up Elevator to 2nd floor.

When: Six Saturdays from September 8 through October 13, 2012. The exam is held on Oct 27.

Time: 09:00 - 12:30 hrs for the seven Saturday mornings, except first day, 08:30 for registrations.

Registration: Pre-registration required by Sept 7. Please contact Chief Instructor to pre-register. Walk-In registrations welcome as class size permits.

Note: 10 students pre-registered is minimum requirement

Fee: \$110 for adults. Reduced rate for Students. Course fee includes Text Book with all Industry Canada exam questions and answers, plus your own binder with the Power Point presentations, IC Rules and Regulations. Please - cash or cheque only at time of registration. Credit cards cannot be processed.

Parking: The City of North Vancouver enforces strict rules about street parking where time limits are posted.

Contact: Chief Instructor Tom Dunn preferably by email at

It's the 100th anniversary of Ham Radio in the U.S.A. (11 minute video):<http://www.youtube.com/watch?v=p6W2h0ThlDw>

FCC has published their report on the importance of amateur radio in emergencies:http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db0820/DA-12-1342A1.pdf

Just wanted to invite you all to our Ham Happenings on 8th September 2012. Please visit our website www.hamhappenings2012.ca for more information.

We hope to see you there,

Yvonne VA7YSF

Secretary

Nanaimo Amateur Radio Association

'Net' Working Internet Resources and Tidbits for Hams

CHIRP

A cellular technology that has Amateur Radio implications

Not to be confused with [CHIRP](#), the free multi-platform Amateur Radio programming software, this Chjrp is an app that transmits data via a burst of "digital birdsong" aims to simplify the way users share images and other files between smartphones. Like an audio version of a QR code, Chirp plays a two-second long noise that sounds as if it was made by a robotic bird. When heard by other devices it triggers a download. The software was developed by Animal Systems, a spin-off business from University College London (UCL). It is free to use, but companies will be charged a fee for add-on services.

At the moment users are limited to sending pictures, website links or 140-character text messages. These appear in a feed similar to Facebook's timeline. Other applications such as Android Beam, Bump, Datasync and Dropbox allow users to swap material via bluetooth, wi-fi or links to cloud-based storage. But Chirp has the advantage that it can quickly send data to multiple devices at once without them needing to be either paired or have a wireless connection. If recipients are offline their devices will remember the "chirp" and download associated content later. "We are pretty sure this is unique," the firm's chief executive Patrick Bergel told the BBC. "We solve the problem of having to pair devices to move data. It's fairly novel to be able to transmit information to anyone who is in earshot - a large number of devices can share the same information at the same time using sound. "You can also use it as a device shifting mechanism. In the future you will be able chirp yourself a link to a map from your laptop."

Mr Bergel says Chirp's distinctive sound allows it to work at low volumes in relatively noisy locations such as pubs, clubs or busy streets. It can also work over public address systems or radio transmissions - potentially allowing broadcasters a way to send up-to-date pictures or links to background information; or an advertiser to send coupons or snippets of a song or promotional video. Animal Systems subscribes to a "blacklist" service to prevent users transmitting known pornographic or illegal-content website links. However, it does not plan to moderate other material.

The application works by uploading a user's material to the firm's servers. The data is then identified with a 50-bit address space: one of trillions of available identifiers. This location is then sent to the sender's device. When the user

presses a button in the app it plays an audio-encoded version of the address.

Copy-protected

Data has long been passed between machines in the form of sound, including recordings on tapes used to load programs into 1980s home computers and early modems dialing into networks. Even so, Mr Bergel said he had taken steps to prevent others copying his product. A feed of messaged material appears beneath a visualized sound-wave "We have a systems patent on moving short codes over the air," he said. "We have also solved a lot of difficult problems. There's a lot of technical issues around moving data and making it robust against noise and echoes." Having launched the app the five-man team behind it will now focus on offering premium services to marketers and other businesses. Mr Bergel said these could include:

- A guarantee that uploaded content would be permanently kept on the firm's servers.
- Access to analytical data letting firms track whose devices have "listened" to their chirp.
- The ability to send video messages that play within the Chirp app.

Mr Bergel said the ultimate goals was to see manufacturers pre-install Chirp on handsets. However, he must first convince users that they need the service at a time when Wi-Fi, 4G data and advanced Bluetooth connectivity are becoming increasingly common.

For now Chirp is only available as an iPhone app. An Android version is promised "soon" but Tim Kirby G4VXE has been testing it on Amateur Radio. If it can be developed for the hobby, the benefits are significant, especially as an emergency messaging mode. Imagine being able to send a high resolution photo in 2 seconds of audio tones.

Read Tim's blog at

<http://g4vxe.blogspot.co.uk/2012/08/experiments-with-chirp-sending-audio-url.html>

Video demo at

http://www.youtube.com/watch?v=4nTOYWD6lkg&feature=player_detailpage

Chirp

<http://chirp.io/>



News You Can Lose The Lighter Side of Amateur Radio

Morse Code in the Martian soil

The CW is still alive and across frontiers and technology.

The Mars Laboratory CURIOSITY captured images of one of its wheels where we can see clearly the writing of the characters in Morse JPL = Jet Propulsion Laboratory.

"For where the robot walk, these marks will be printed on CW in the Martian soil!". In fact they will, but the dots and dashes notched on the wheels of Curiosity is not a tribute to Morse Code and of us - Amateur Radio, indeed they are part of the visual odometry of the robot.

Link to see originals photos [here](#) and [here](#).





RAC News Radio Amateurs of Canada

Dominican Republic Emergency Network activated, given the proximity of tropical storm Isaac

Day-time operation frequency 7065 kHz

Coordination station HI8COE, Emergency Operations Committee

Evening operation frequency 3780 kHz

Emergency frequencies to be used by Cuba

7110 kHz day-time, PRIMARY NATIONAL

7120 kHz day-time, SECONDARY NATIONAL

7045 kHz day-time, EASTERN REGION

3740 kHz evening, PRIMARY NATIONAL

3720 kHz evening, SECONDARY NATIONAL

3715 KHz alternate evening

Other frequencies in the range from 7030 to 7125 kilohertz would be used by province networks as necessary. Other frequencies in the range from 3700 to 3770 kilohertz would be used by province networks as necessary

Thanks in advance to all amateur radio stations of Region 2 for offering the greatest possible protection to the frequencies used for emergency operations

NOTE: Jamaica traditionally does NOT use shortwave bands for emergencies since they handle these in the 2-metre band, using their repeaters located in the mountain ranges.

Non-Amateur Use of Frequency in BC

From August 5th to 12th, the Canadian Paragliding National Championships were held in Pemberton, BC. The Radio Amateurs of Canada became extremely concerned about the organizers assertion that all participants must use a VHF radio tuned to 146.415 Mhz. This frequency is inside the two meter amateur allocation. Amateur operators are the primary user of this band and incursion by non-authorized users is of great concern.

RAC has been in contact with representatives from the Paragliding community and has also requested enforcement action to be taken by Industry Canada. The Radio Amateurs of Canada does not generally discuss enforcement while an investigation is ongoing. However,

given the scope of concern over this matter it is appropriate to release details of actions to date.

Industry Canada has advised this morning that their British Columbia office has notified the group that use of Amateur Radio Frequencies by persons who are not in possession of a valid Amateur Radio Operator's Certificate is not permitted. The group has assured Industry Canada that all participants who used the channel were indeed holders of a certificate. A notice indicating the requirement to hold an operators certificate has been added to the website of the group.

Additionally, Industry Canada has advised the group of a VHF frequency inside the Aeronautical Radio Frequency Band that has been allocated for their use on a Canada Wide basis.

The Radio Amateurs of Canada has prioritized protection of Amateur Radio Frequencies from incursion. If you suspect incursion on an Amateur Band or are aware of the illegal operation of Amateur Radio products by individuals or companies that do not hold operators certificates, contact the Radio Amateurs of Canada to report your concerns.

The Radio Amateurs of Canada is the national voice of Amateur Radio Operators in Canada. Our members enjoy numerous benefits including access to The Canadian Amateur publication. We extend frequency protection work to members and non-members alike to ensure the future of our hobby and emergency service work.

RAC 2012 AGM

The Radio Amateurs of Canada is pleased to hold its Annual General Meeting (AGM) in Montreal, Quebec. It will be hosted by the Montreal Amateur Radio Club (VE2ARC) which is celebrating its 80th anniversary this year.

The AGM event will be held in conjunction with the second annual Radio Talk conference which is being held at the same location. All RAC members are encouraged to attend the Annual General Meeting.

Date: Saturday, September 22, 2012 16:00

See the following link for details

http://www.rac.ca/en/rac/agm/2012_AGM_RAC_e.pdf

The SARC Calendar ...all about the Amateur Radio month ahead in Surrey

September 2012						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26 	27	28	29	30	31 Weekly SARC Breakfast 8:30 ABC Restaurant 74th & King George Blvd.	1 CONTEST: All-Asian DX Contest [SSB]
For details on all SARC events, go to ve7sar.net For details on all SEPARS events, go to separs.net						
2 CONTESTS [Cont'd]	3	4 SEPAR NET 7:30 SARC NET 8:00	5	6	7 Weekly SARC Breakfast 8:30	8 CONTEST: - WAE DX Contest [SSB] - ARRL VHF QSO Party Langley Cruise-in
9 CONTESTS [Cont'd]	10	11 SEPAR NET 7:30 SARC NET 8:00	12 SARC General Meeting	13	14 Weekly SARC Breakfast 8:30	15 CONTEST: - Washington State Salmon Run [All modes]
16 CONTESTS [Cont'd]	17	18 SEPAR NET 7:30 SARC NET 8:00	19	20	21 Weekly SARC Breakfast 8:30	22
23	24	25 SEPAR NET 7:30 SARC NET 8:00	26 SARC Exec Meeting	27	28 Weekly SARC Breakfast 8:30	29 CONTEST: - CQ WW DX Contest [RTTY] - Texas QSO Party
30 CONTESTS [Cont'd] LARA Com-Fest	Contest Details: http://hornucopia.com/contestcal/contestcal.html					



QRT John Brodie VA7XB

Last Call For Cruise-In Help

Welcome back and I hope everyone had a good summer. The Fall season will start off with a bang when we join Langley ARA at the **Good Times Cruise-in** on Sept. 8th.

This is an opportunity to show the SARC flag and promote our club and amateur radio in general. In addition, the two clubs will be selling raffle tickets to raise money for club activities during the year. We still need volunteers for this event. If you are willing to put in a few hours to represent SARC and sell raffle tickets at the Cruise-in please get in touch with me at 604-591-1825 or va7xb@rac.ca.

While not performing SARC duties at the event, you may wish to take the opportunity to check out all the vintage cars and other displays. This is the first time SARC has done this, and we need to make a big effort to ensure that we don't take a loss on our ticket sales, as we already have over \$1000 invested in prizes.

SARC General Meeting Sept 12th

Our first general meeting is usually when we assign duties for all the various tasks that need doing during the upcoming year. Most notably, we are still in need of a club secretary, a person to take charge of equipment maintenance, and a good writer who will interview members and prepare a profile each month for the Communicator. The theme of the September meeting is "BC WARN", which has recently been installed at the new SARC repeater site and greatly expands our repeater functionality in times of disaster. Come and hear Ian Procyk VE7HHS describe what BC WARN is all about, how it works and why it is important to our emergency communications capability.



Three monkeys, ham radio style